B A U S C H & L O M B I N C O R P O R A T E D

R O C H E S T E R 2, N E W Y O R K

March 16, 1964

Subject: Contract 705, T. O. 3

Gentlemen:

Enclosed are two copies of the Progress Report for the period 31 January 1964 through 28 February 1964. Additional copies are being sent directly to your technical representative.

Contact me if you have any questions regarding this report.

Very truly yours,

25X1A [redacted]

Analytical & Photogrammetric
Instrument Sales

RHT:bp
Enc.

VARIABLE MAGNIFICATION TRACING PROJECTOR

U. S. GOV. ORDER 2MP34048

Monthly Progress Report

covering the period from

Jan. 31,1964 thru Feb. 28,1964

The following work was accomplished on the contract in compliance with Category "A" of the Bausch & Lomb letter dated Aug. 16, 1963 as confirmed in SA#4 of the contract.

The illumination level increase, and the rigidization of the enlarger head mount are considered the primary requirements in that order of importance. A three lens condenser system in combination with a focusable lamp and reflector was specified by the optical designer and observed in a breadboard set-up directly on the projector with the Omega enlarger head removed. A comparison of brightness in foot lamberts between the tabulated values in Enclose "A" of the Aug. 16 letter and the values taken under controlled conditions from the breadboard set-up are as follows:

Lens	4" at f/5.6	7" at f/5.6	12" at f/16
Brightness (B_L) (long conjugate)	190	240	200
Calculated (B_L)	65-17	206-52	60-22

The above readings were taken under identical conditions to previous B_L readings taken with the Omega enlarger system. Readings in ft. candles were also taken and compare to those of paragraph 1 Enclosure "A" as follows:

Lens F.L.	On Axis		Corners
4" f/5.6	2½	OMEGA -D-2 SYSTEM	4½ 2 2 4½
7" f/5.6	4½		4 8 9 5
12" f/16	3		2 2 2 3
4" f/5.6	13	3 CONDENSER BREADBOARD	9 19 9 5
7" f/5.6	31		35 46 35 29
12" f/16	22		30 37 23 19

The above values are in excess of expectations producing a high contrast image for tracing purposes. Some under-filling of the gate attributed to improper imaging of the filament in the lens aperture causes corner vignetting of the screen image. The optical designer is working on the correction of this condition employing stock condenser lenses where possible.

This system consists of three condensing lens elements a heat filter and a lamp reflector combination. The lamp and reflector will be mutually focusable on a rack and pinion

mount so that for each projection lens the operator must focus the lamp to the proper position which will be indicated by engraved cap rings clamped over the knobs of a microscope focusing upright. In addition the condenser nearest the lamp is retracted rearward out of the optical path when projecting with the 12" lens. 500W tungsten lamps with suitable filament sizes were not recommended by the lamp manufacturers for a horizontal burning position where blackening of the envelope was to be expected. Therefore a 420W Quartz Iodide Type FAL lamp is to be used and was used in the setup above.

Design and detail of parts for the Rigidization of the enlarger head support was initiated. Detail drawings for the adjustable lamp-reflector assembly were released for manufacture on Feb. 25. The entire Omega D-2 enlarger head and mounting structure is to be removed and a rigid two rail stand is in the detail drawing stage to form a solid mount from which images free of shake and vibration are to be projected. Other design features which are being considered or are to be included are:

1. Forced air cooling of the film gate area and the lamp housing. (included)

2. Glass sandwich film gate for maintenance of film flatness with the side advantage of closure of the opening to the lens turret for exclusion of dust. (included)

3. Multiple nylon rollers flank the gate for protection of film in transport. (included)

4. The locking casters will aid in stabilizing the unit against vibrations.

5. A lamp dimming circuit which has been designed and manufactured for a similar instrument. (to be included)

Scheduling - Present scheduling of design detail, fabrication and testing activities are aimed for a modification completion date in the third week of March 1964. The 30 April delivery schedule allows a month's time for minor modifications deemed necessary or desirable as a result of your technical representative's review. Mechanical design detail, and manufacturing and assembly are therefore slated for completion within the next reporting period.

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